

# Medium voltage underground cable machine splicing and its requirements

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# Presentation Contents

- ✓ **Prysmian Group Overview**
- ✓ **Splicing Machine Requirements**
- ✓ **Medium Voltage Cable Introduction**
- ✓ **Splicing Process**
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**WORLD LEADER** in the energy and telecom cable systems industry

**PARTNER** of the world's key players

**A STRONG REPUTATION** for performance and innovation

**A LISTED COMPANY** without a controlling shareholder, managed on a transparent basis  
(over **9,200 employees as investors**)

**+50** Countries



**108** Plants



**26** R&D Centers



**+29,000** Employees



**+12 €B** Annual Sales



# Worldwide leader in the cable industry



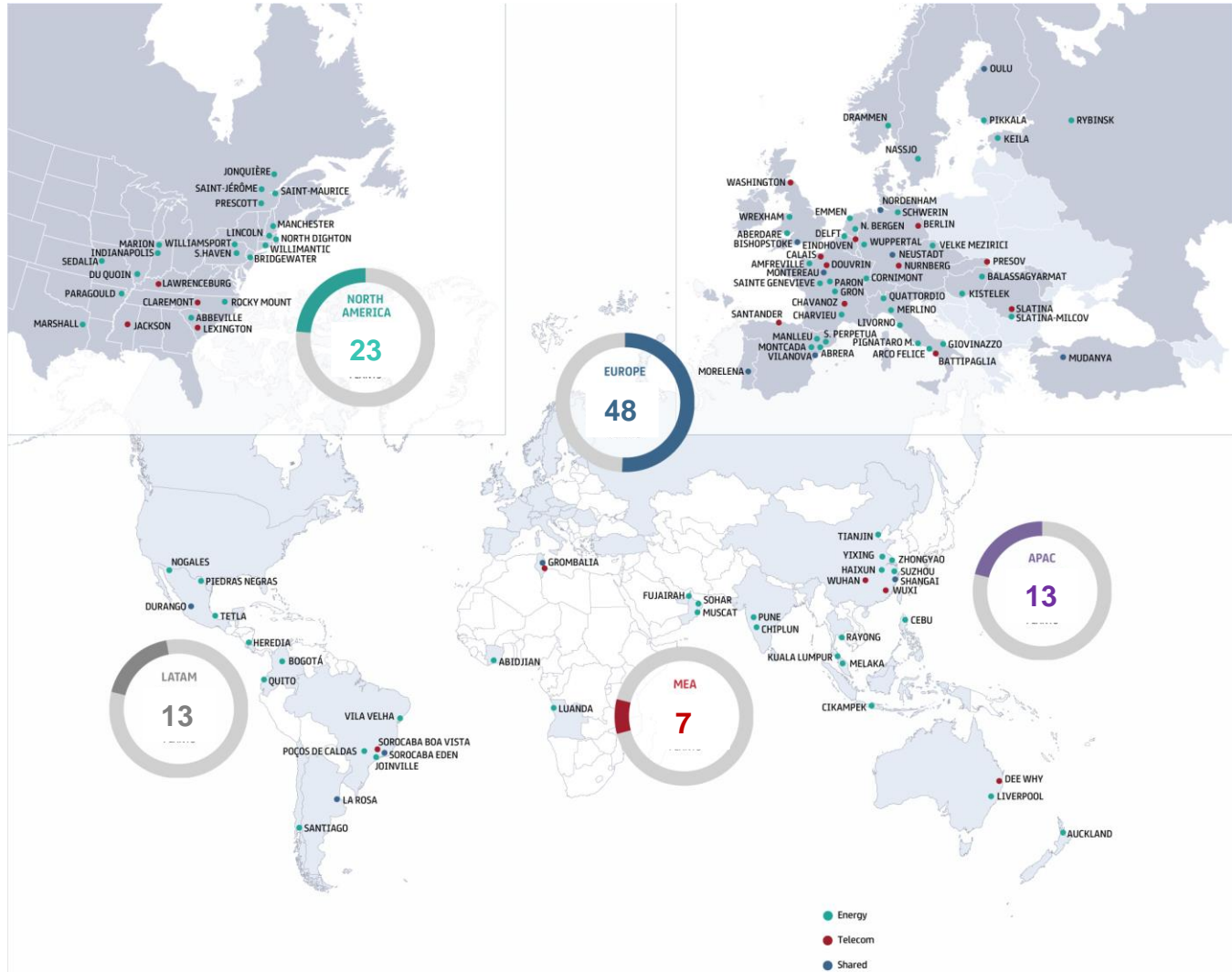
 **104**  
PLANTS



**25 R&D**  
CENTERS























 ABOUT **29,000**  
EMPLOYEES

OVER **11**  
BILLION ANNUAL  
SALES FY 2019





# Product Portfolio

	Power Distribution	Trade & Installers	Telecom	Specialty	Energy Projects (HV)
Key products	LV, MV and Wind Distribution Cable 	Copper and Aluminum Building Wire 	Datacomm Copper Cable 	Aluminum Rod & Strip 	
	Bare Aluminum Conductor 	LV & MV Power Cable 	Fiber Optic Cable 	Mining, OGP, Military, Nuclear, Transit and other Specialty cables 	High Voltage Cable 
	OPGW 	Control, Power, Automation, Instrumentation and Armored Cable 	ADSS Fiber Cable 	4G, Bridge, Cranes, Defense, Fire Protection Systems, and Water Wire and Cable 	Terminations Joints/Splices GIS Terminations Transition Joints Link Boxes 
	Terminations, Splices, and Accessories 	Electronics Cable, Cord & Cordsets 	Telecomm Cable 	Industrial Wire Harness and Assemblies 	
Key channels to market	<ul style="list-style-type: none"> <li>Sells via direct channel to IOUs and Public Power with some through distribution</li> </ul>	<ul style="list-style-type: none"> <li>Sells via distributor channel</li> </ul>	<ul style="list-style-type: none"> <li>Sells via direct channel to Telcos and distributor channel to contractors and end-users</li> </ul>	<ul style="list-style-type: none"> <li>Sells via distributor, Direct and OEM channels</li> </ul>	<ul style="list-style-type: none"> <li>Sells via direct channel to customers</li> </ul>
Key Brands					

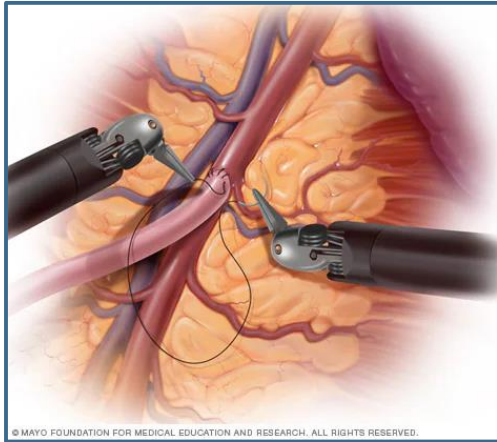
# Splicing Machine

# Technology Advancement Scenarios

## Human Body Nerve System

The surgeon who operates from 400km away,  
Rose Eveleth, 15th May 2014, BBC FUTURE

China's First-Ever 5G Remote Brain Surgery,  
Abdullah Nasir June 11, 2021, Wonderful Engineering



## Underground Cable Network

Boston manhole explosion hospitalizes 2 utility workers  
Bradford Betz, FOX NEWS, July 12, 2022

Florida firefighter critical trying to save 3 men who died in manhole  
Charles Rabin & David Goodhue, Miami Herald: Jan 6, 2017



# Why Splicing Machine innovation is needed?

- ✓ **Improve UG cable network reliability**
- ✓ **Reduce overall installation cost**
- ✓ **Reduce operations time**
- ✓ **Improve Human Safety**

Let's quickly understand MV cable and splicing process



## Medium Voltage (5-46kV) Utility Cable



## Cable Construction Types



## Cable Preparation – Key steps

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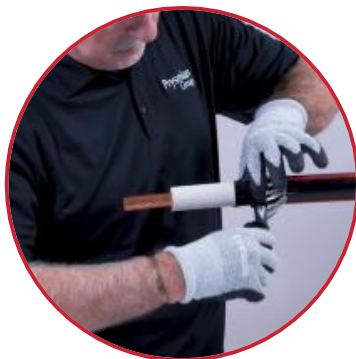
Remove the cable jacket



Jacket Materials:

- Polypropylene (PP)
- LLDPE
- XLPE

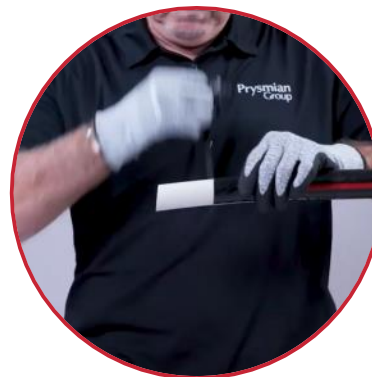
Flare up the neutral wires  
apply PVC electrical tape



Neutral Types:

- Round wires
- Flat Straps
- Tapes

Remove the Insulation Shield



Insulation Shield:

- Strippable (3-18 lbf./inch)
- Bonded (>20 lbf./inch)

Remove the Insulation



Insulation:

- XLPE
- EPR
- PP

## Splicing Operation – Key steps

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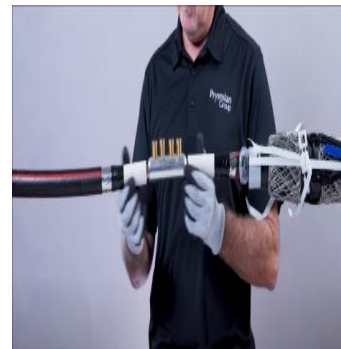
Clean and abrade  
the cable jacket



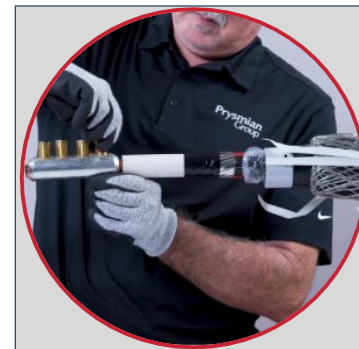
Position Splice on to  
the cable



Insert the conductors  
into the connector



Tighten shear bolt and  
complete finishing steps



### Splice Types:

- Cold Shrink
- Heat Shrinkable
- Molded rubber
- Lead molded

# Manhole conditions



Multi-phase cables



Mix of energy and optical cable



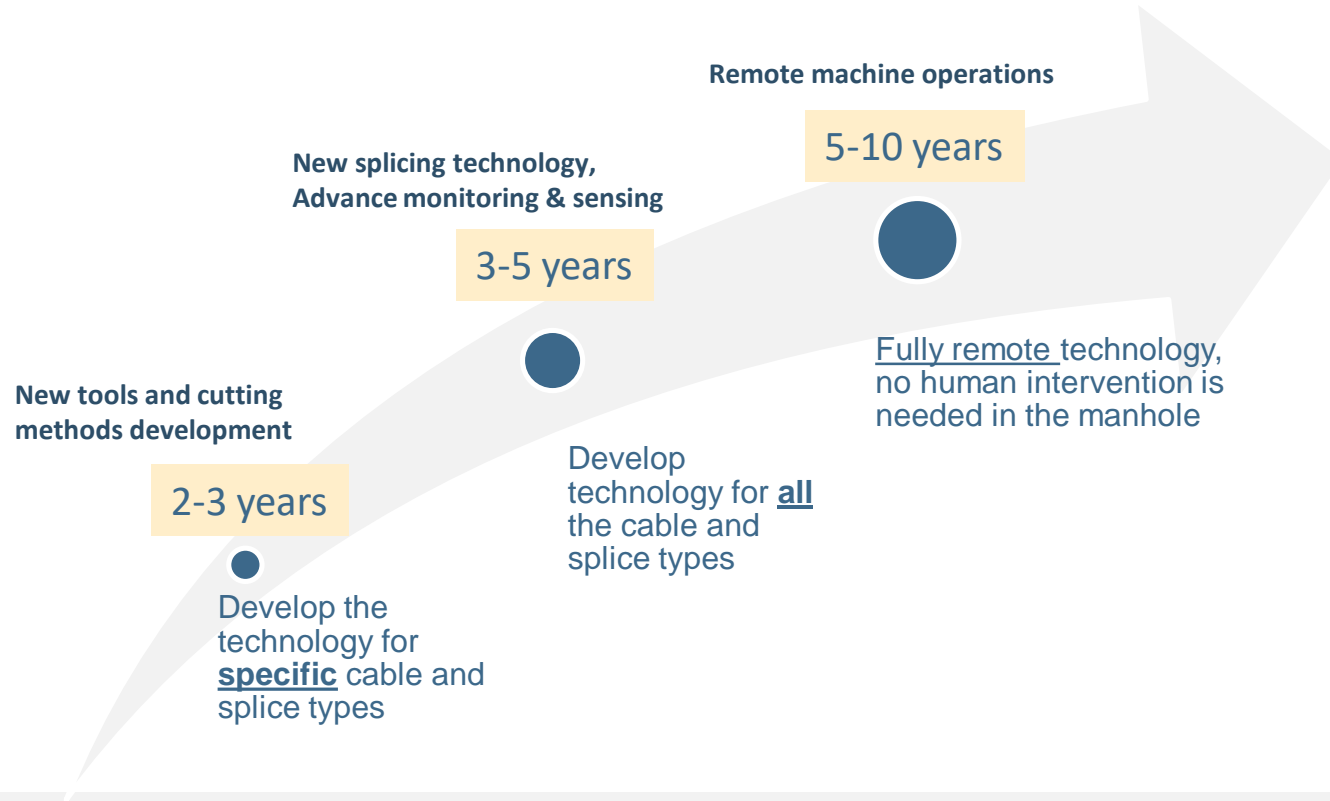
Dr.Phil Kim and Dr. Jake Russel (ARPA\_E)

## Innovative Splicing Machine Requirements

- ✓ Able to prepare all types of cables
- ✓ Able to splice different using technologies – New splice technology may be needed
- ✓ Reduce cost, time and improve reliability
- ✓ Ensure consistency quality - inbuilt imaging and AI quality control system
- ✓ Need monitoring technology



# Splice Machine Technology RoadMap



An aerial night photograph of the Chicago skyline. The Willis Tower is the most prominent building, standing tall on the right side of the frame. The city is densely packed with illuminated skyscrapers and residential buildings, their lights reflecting on the dark streets. The sky is a deep purple and blue, suggesting twilight. The overall scene is a vibrant display of urban architecture at night.

Thank you